

DOCUMENT RESUME

ED 246 902

IR 050 784

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TITLE The Information Economy: What's an Educator to Do?
PUB DATE Jul 84
NOTE 11p.
PUB TYPE Viewpoints (120) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Community Organizations; Curriculum Development;
*Educational Needs; Educational Research; Educational
Responsibility; *Educational Trends; *Education Work
Relationship; Emerging Occupations; Equal Education;
*Futures (of Society); *Government School
Relationship; Postsecondary Education; Public Policy;
School Business Relationship; Secondary Education
IDENTIFIERS *Educators; *Information Economy; Information Policy;
Southwest Educational Development Laboratory

ABSTRACT

In order to learn more about the problems of educating students to adequately prepare them for jobs in today's information economy, leaders in education, government, business, and civic organizations met in June 1983 at the Southwest Educational Development Laboratory (SEDL) in Austin, Texas. The symposium participants came from and research focused on the six states of Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma, and Texas. As a result of the presentation of research and trends and the discussions following the presentations, the participants suggested the following recommendations for the future: (1) conducting research on the effects of regulation and deregulation of information technology policy on education; (2) consideration by state and federal policymakers of the needs of education during the development of information and communications policy; (3) equitable allocation of resources, including equipment, materials, and assistance; (4) development of curricula promoting skill in communication, synthesis, and quantification; and (5) decisionmaking by representatives of industry, community groups, and pre- and post-secondary educators regarding the responsibility of each segment in the general education and career training of youth. It is concluded that a multi-pronged approach must be taken to ensure that the needs of learners in the current information economy are met. (DMC)

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U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
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THE INFORMATION ECONOMY: WHAT'S AN EDUCATOR TO DO?

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July 1984

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Educators are well aware that we in the United States live in what, as long as eleven years ago, Daniel Bell called the post-industrial society, one characterized by the priority of brain labor over manual labor. In particular, according to Bell, "what counts is...information." Studies and speculative articles abound on this statement.

Among the most persuasive and most often quoted of these studies are those conducted by Henry Levin and Russell Rumberger of Stanford University's Department of Education. Using data from the U.S. Bureau of Labor Statistics, they projected that by 1990 three of the five fastest growing occupations -- data processing, computer systems analysis and computer operations -- will involve the high technology machinery that we associate with The Information Economy. They go on, however, to warn that, while these are the highest growth industries, measured in dollars, the number of new jobs produced by these and other high technology occupations is small. Only 2.4% of the jobs in the U.S. in 1990 will require professional use of high technology (in such jobs as computer mechanics and office machines service), whereas 13.3% of the jobs will consist of non-high technology work such as janitors, hospital orderlies, and cashiers. Thus they conclude that relatively few jobs will require training beyond high school.¹

Because Levin and Rumberger are both sound researchers and respected educators, their forecasts have reverberated among

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educators who must decide now what to teach children who in only five years will graduate into this world. Do we prepare everyone to compete for the small percentage of jobs on which The Information Economy rests? Or do we prepare them for relatively menial work lives and the expectation of devoting their energies to more satisfying avocations? A further alternative is that in determining school curricula we ignore the requirements of the workplace and prepare young people to think, analyze and solve problems, and leave vocational training to industry. In fact, recent research by Norton Grubb at the Lyndon B. Johnson School of Public Affairs indicates that vocational education in high schools is increasingly irrelevant to the needs of industries; firms are spending increasing dollars and time in re-training new employees.

Because of the overwhelming evidence, therefore, that the U.S. relies more and more on service industries and the trading of information for its economic growth, educators must answer For what are we teaching our children? As basic as this question is, however, an even more unsettling one arises when we realize that, if information, rather than products, is the commodity, then information itself must have a value. The question, What is information worth? is not a new one to lawyers who must decide whether the tax on a floppy disc is assessed according to the value of the disc or according to its contents. But to those whose business it is to provide information in a system of free public education, the question of the dollar value of the stuff of education is a disturbing one.

In order to learn more about these problems and to address them, leaders in education, government, business, and civic organizations met in June 1983 at the Southwest Educational Development Laboratory (SEDL) in Austin, Texas. (In keeping with the boundaries established by the National Institute of Education, the major funding agency of SEDL, the symposium participants came from and research focused on the six states of Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma and Texas.) A research paper, Information and the Economy: Policy Issues for Educators had been prepared and sent to the participants in advance. Its major conclusions were summarized at the symposium along with presentations on the meaning for education of the Information Economy from the perspectives of business, federal policymakers and higher education.

The research used "organized symbols" as the definition for "information" and "activities of producing, processing and distributing information" as the working understanding of an "information-based economy." It revealed that, just as population and the economy as a whole are burgeoning in the Southwest, so is the rate of growth of information industries.

While the number of information businesses in the U.S. increased 31.6% between 1972 and 1980, the number of such businesses in the Southwest in the same period grew 50%. Furthermore, the growth in this sector "far exceeded the growth of the total number of businesses" in the Southwest of 36.5%.² Thus, the growth of information business in the Southwest outpaces both other business development in the region and the growth of such business in the rest of the country.

The table below, which shows a detailed classification of the information sector, illustrates both the involvement of the region in information-based industries and the extent to which the region outdistances the nation in these categories.

GROWTH OF INFORMATION SUBUNITS, 1972-1980

	<u>U.S.</u>	<u>Southwest</u>
Knowledge Production and Invention	33.6%	56.2%
Information Distribution and Communication (Excluding Schools)	22.6%	24.0%
Search and Coordination	43.6%	57.4%
Information Processing and Transmission	44.9%	85.5%
Information Goods Manufacturing	35.0%	55.4%
Trade in Information Goods	40.0%	85.5%

These statistics on the apparent good health of the economy of the Southwestern United States might be encouraging for both business and education were it not for demographic developments in the region which complicate the picture for both sectors. In four of the six states, minorities, who tend to lag far behind the Anglo population in income level and educational attainment, constitute more than 35% of the school-age population. All of the states, furthermore, exhibit lower median incomes than the national average and higher percentages of individuals and families below the poverty line.³ Because, in addition to these factors of life, the region is likely to continue to have a larger rural population than the country as a whole, "it will likely be difficult for them to find

employment opportunities in the primary information sector."⁴

All of these characteristics threaten to widen the gap between the information poor and the information rich.

This disparity is exacerbated by the paradox that just as information becomes increasingly available so does it become more valuable. According to Kay Coleman, Director of Corporate Planning for Educational Testing Service, a product's price can be determined in one of several ways. In the service sector it is increasingly common for the price of the service delivered to be determined not by production cost but by "customer values," that is the value placed on it by the user.⁵ Because information is what educators deal with, the risk exists that the cost of the stuff with which we work will drastically inflate along with roofing materials and career ladder plans. (It is important to understand that the fact that the cost of computers is declining only minimally diminishes this problem, for computers and other technologies are merely the conveyers of information, not the information itself.)

In order to diminish the inequities among populations, as addressed by Hudson and Coleman, Americans, at times, turn to the federal government that, in its ability to make nationwide policy, can address such problems. Yet, a concurrent, and complicating, trend discussed at the symposium is the deregulation of information policymaking at the federal level. This approach is occurring even in key information agencies such as the Federal Communications Commission, the Department of State (despite a recently formed Office of Coordination for International Communication and Information Policy, whose ability actually to coordinate State

Department activity in this area is uncertain) and the National Telecommunications and Information Administration. Unlike other countries that have ministries or central administrations for post, telephone and telegraph, the U.S. adheres to a decentralized process. As Jane Bortnick, who is a Specialist in Information Science and Technology for the Congressional Research Service and who presented her views on these issues, stated at the symposium, "the American approach to information policy often is not to have an overall policy -- to let the market forces work things out."⁶

One of the results of deregulation of what is traditionally a decentralized approach is that American business' ability to compete in the international information marketplace is jeopardized. Information products and services currently rank third in American exports but are expected to rank first by the end of this century. Some business people and members of Congress question whether or not an ad hoc approach will support American industry in international competition against countries, such as France and Great Britain, that have national communications structures and policies.

At the state level, also, numerous agencies work in information and communications areas. These include education agencies, public utilities commissions, cable television corporations and state purchasing commissions. These institutions, however, rarely work in concert with one another and, in fact, sometimes conflict or act unaware of one another's needs. For instance, fruitful cooperation between cable television and local education agencies is not easily secured or maintained.

Nevertheless, schools are beleaguered with demands to provide training in advanced technologies to students. Symposium participants learned that the understanding of "literacy" changes whenever a new technology acquires widespread use and that a "new literacy" is gaining currency.⁷ This new literacy demands a high level of proficiency with hardware and preparation for technology-related employment, even though resources for hardware purchase may be unavailable, teachers are not trained, research into the effects of computer use on students and on the attainment of educational goals has not been thoroughly conducted, and state policies are in many cases as yet unarticulated. Above all, as evidenced above, industry's needs vary greatly and may not include the skills engendered by this new definition of the literate citizen.

In fact, according to recent reports, too many high school students do not know the basics about business, such as the meaning of "corporation" or the necessity to come to work on time. An alliance between corporations and secondary schools in New York City has grown "out of the widespread dissatisfaction with the quality of the country's high school graduates....Many employers and several studies have found that a large percentage of the 40 million students who graduate from high school each year lack the skills and work habits necessary to become productive employees."⁸ The issue, however, is not only what students need to learn but also which segment of society is responsible for conveying the lessons. Should high schools teach strategic planning? Or, is the work of business better taught by business?

The presentation of research and trends and the discussions following the presentations fostered numerous questions among the business, civic and educational leaders. These included:

- | How should we differentiate between education and training, and who gets which?

- | How can we avoid having an "information elite?"

- | What does industry require of public education?

- | What can be done to ensure a strong American role in the information marketplace? Do school policymakers have an impact on this role?

Though these questions are fundamental and challenging (in fact, intimidating), participants proposed steps to address them. Among the recommendations suggested for the future are:

- | Conducting research on the effects of regulation and deregulation of information technology policy on education;

- | Consideration by state and federal policymakers of the needs of education during the development of information and communications policy;

- | Equitable allocation of resources, including equipment, materials and assistance;

- | Development of curricula promoting skill in communication, synthesis and quantification; and,

- | Decisionmaking by representatives of industry, community groups and pre- and post-secondary educators regarding the responsibility of each segment in the general education and career training of youth.

These recommendations are addressed to the various sectors, such as state and federal agencies and the business community, most appropriate for considering them. The policy issues confronting educators in this Information Economy are complex and inevitably overlap with the needs and policy formulations of many segments of society. In addition, educators are burdened by the complexities of the creation, organization, handling, selling and policymaking surrounding information, which is the raw material of education, as it is increasingly the raw commodity for U.S. businesses. Thus, a multi-pronged approach must be taken to assure that the needs of learners in this Information Economy are met.

FOOTNOTES

1. Hudson, H. Information and the Economy: Policy Issues for Educators. Southwest Educational Development Laboratory, June 1983, p. 16.
2. Information and the Economy: Policy Issues for Educators, pp. 12-13.
3. Cullen, R.; Fredlund, E.; Sullivan, T. Population Statistics for Educational Needs in the Six-State Region: A Descriptive Analysis. Exploring Major Social Forces. Southwest Educational Development Laboratory, February 1983, pp. 56-57.
4. Information and the Economy: Policy Issues for Educators, p. 23.
5. Coleman, P.K. Perspectives Within the Industry. Information and the Economy: Policy Issues for Educators, A Report and Recommendations, (Lynn York, Ed.). Southwest Educational Development Laboratory, August 1983, p. 35.
6. Bortnick, J. Perspectives on Federal Information Policy. Information and the Economy: Policy Issues for Educators, A Report and Recommendations, p. 46.
7. Compaine, B. Perspectives on the New Literacy. Information and the Economy: Policy Issues for Educators, A Report and Recommendations, pp. 66-67.
8. New York Times, May 28, 1984, p. 11.